Market Power Excessive Share

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Background

Guidelines for determining what is an excessive share in an ITQ/IFQ fishery.

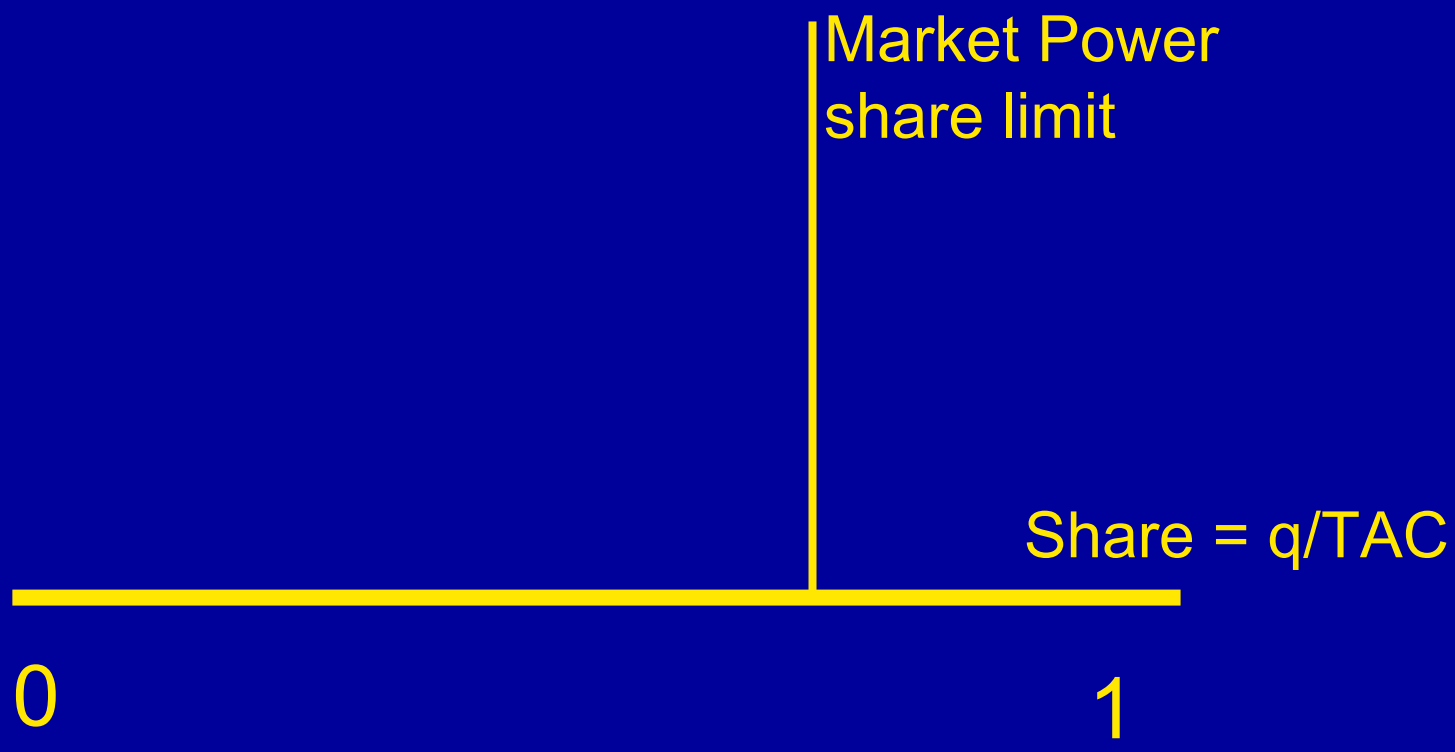
Two things to consider

Market Power excessive share

Management objective
excessive share

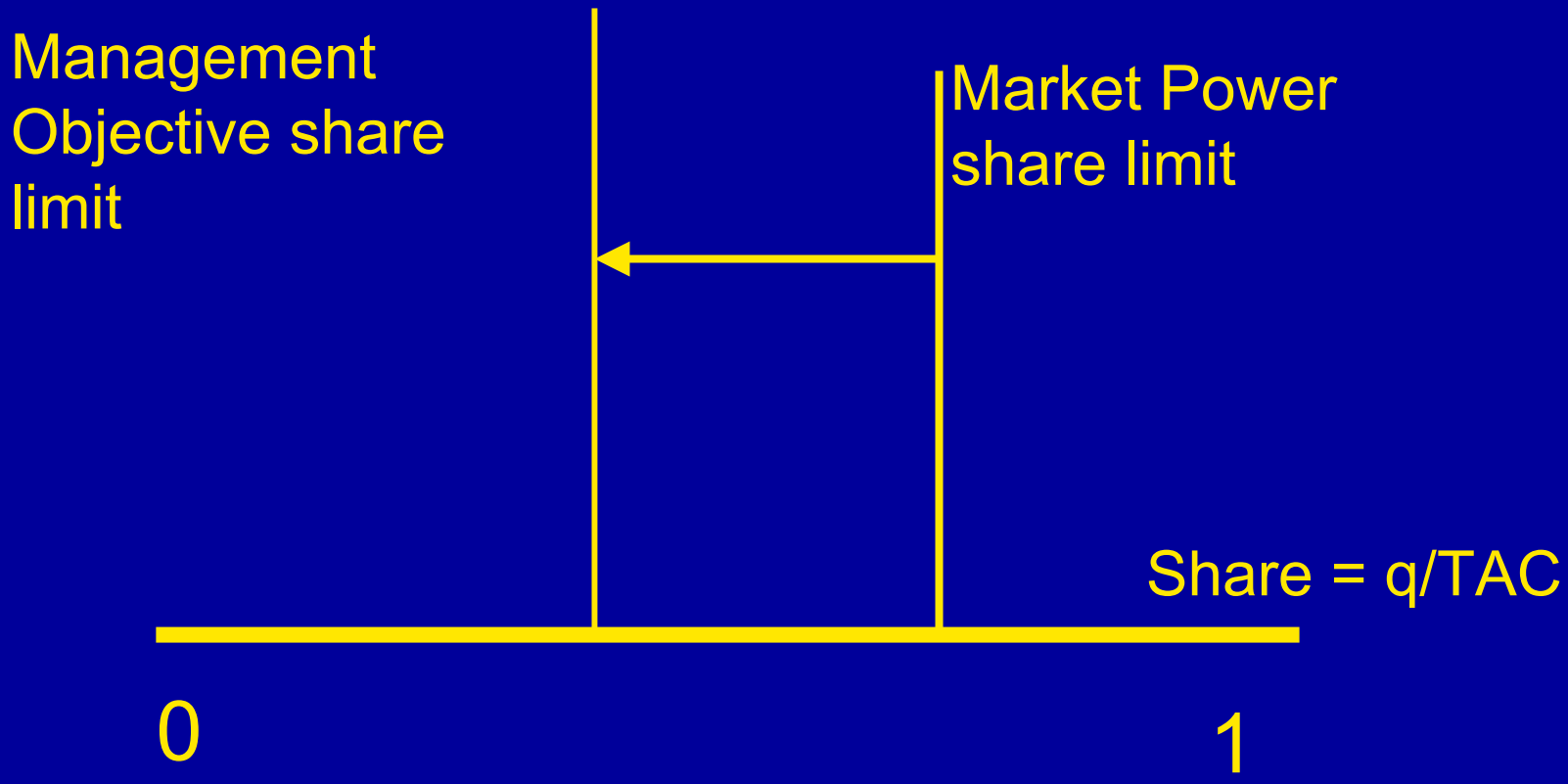
Market Power share limit:

That share that will eliminate incentives to withhold production.



Management Objective Share Limit

The share limit that is necessary to achieve management objectives



Today I want to focus on the determination of the market power share limit.

Jim Waters and Joe Terry suggested that the current discussion of market power excessive share could be improved by looking at elasticity of demand for individual participant.

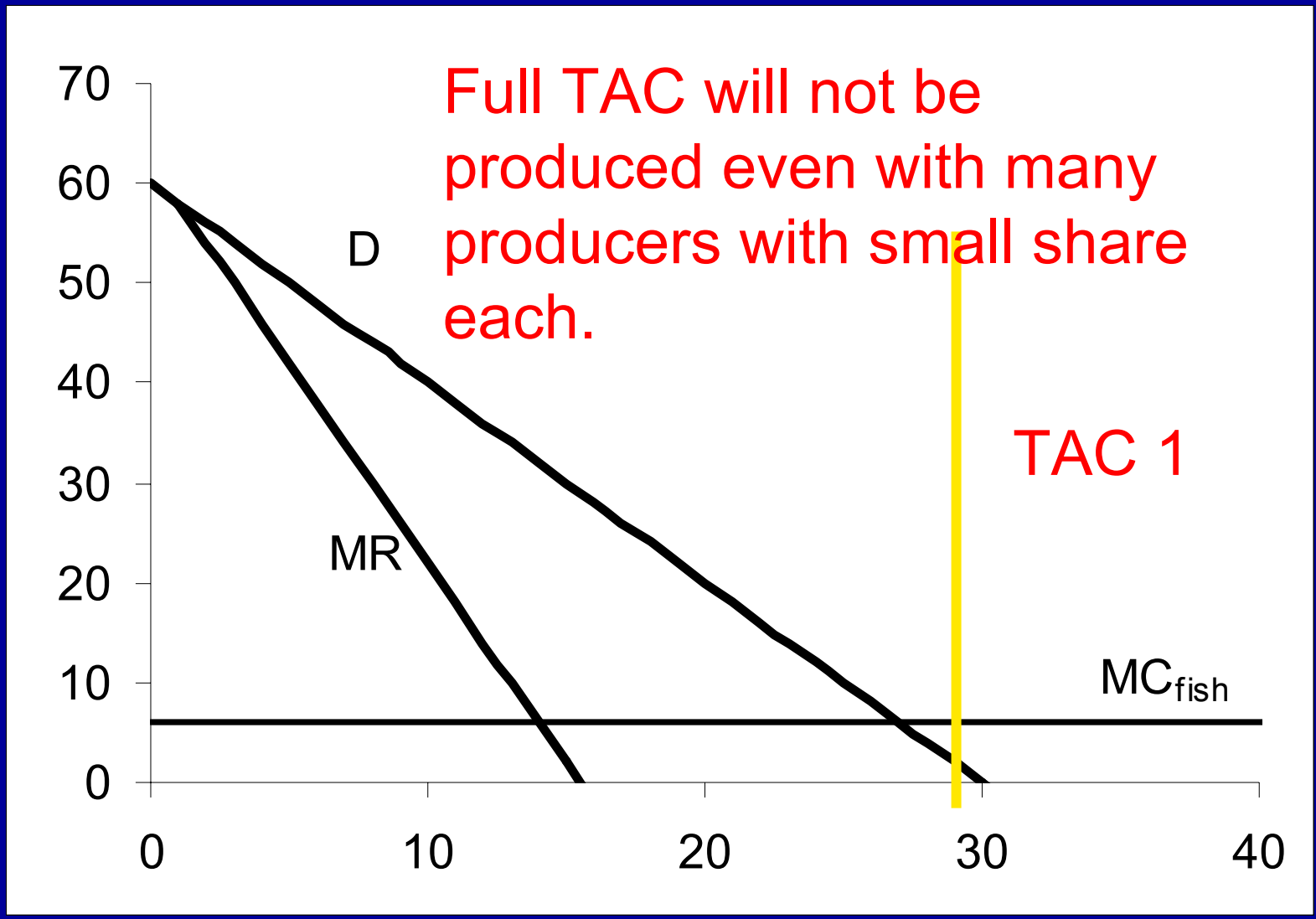
I took that suggestion and also considered MC_{fish} and came up with the following analysis.

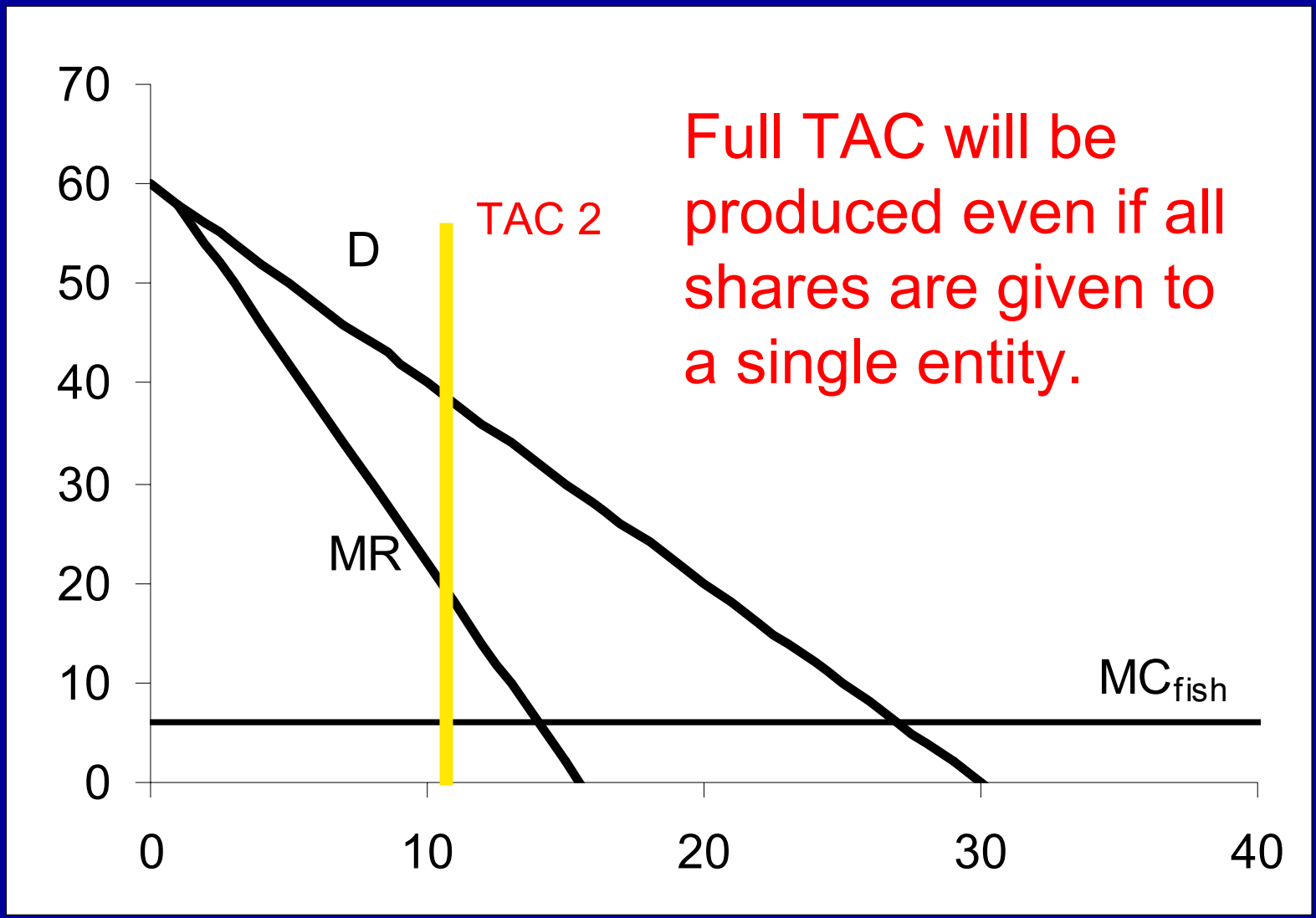
To peak your interest, for the sake of discussion I submit that in many situations the market power excessive share will equal

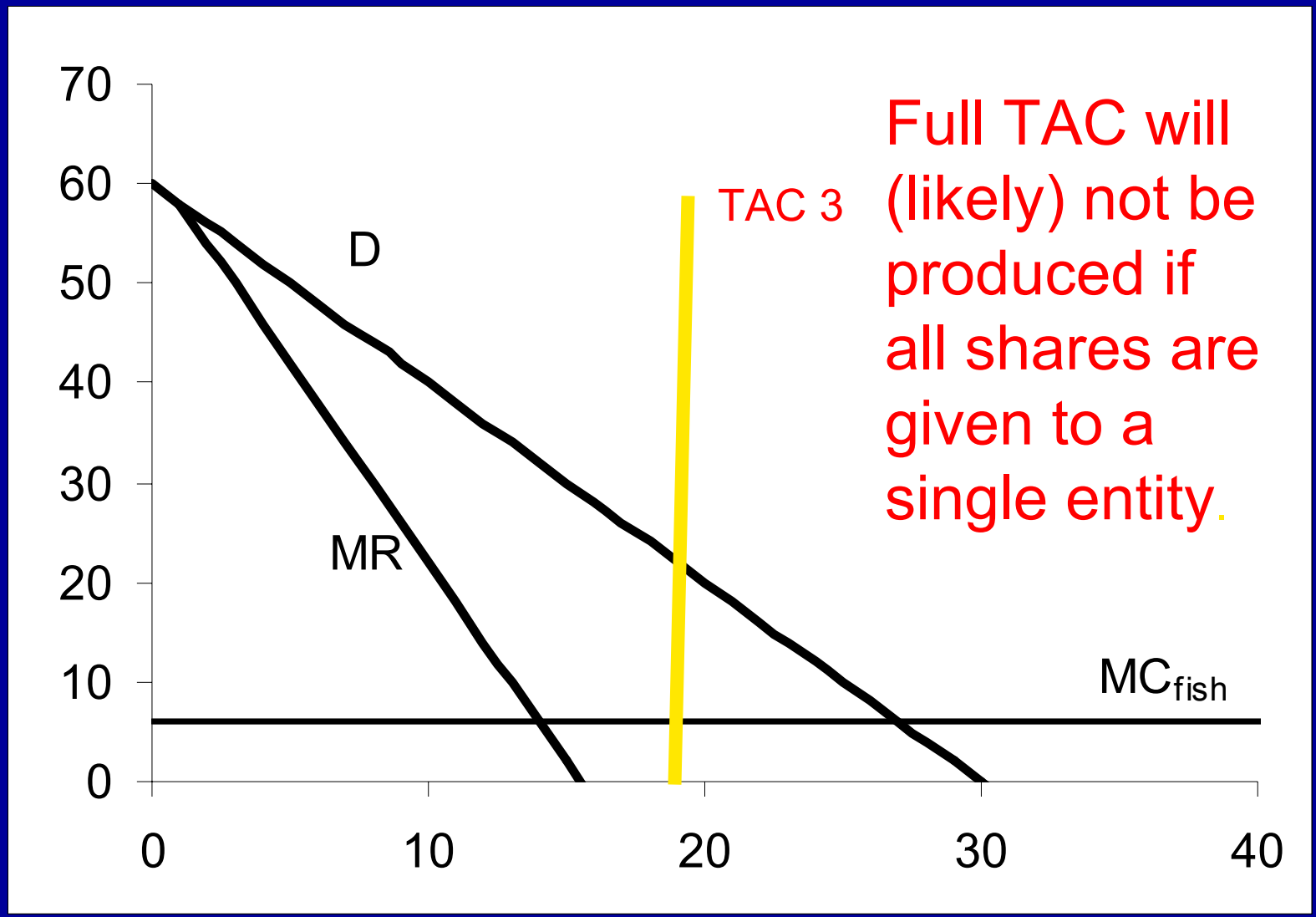
$$s = [1 - MC_{fish}/P]$$

That is, s is the largest % of TAC that any one entity should hold.

Let’s do some very general theory.

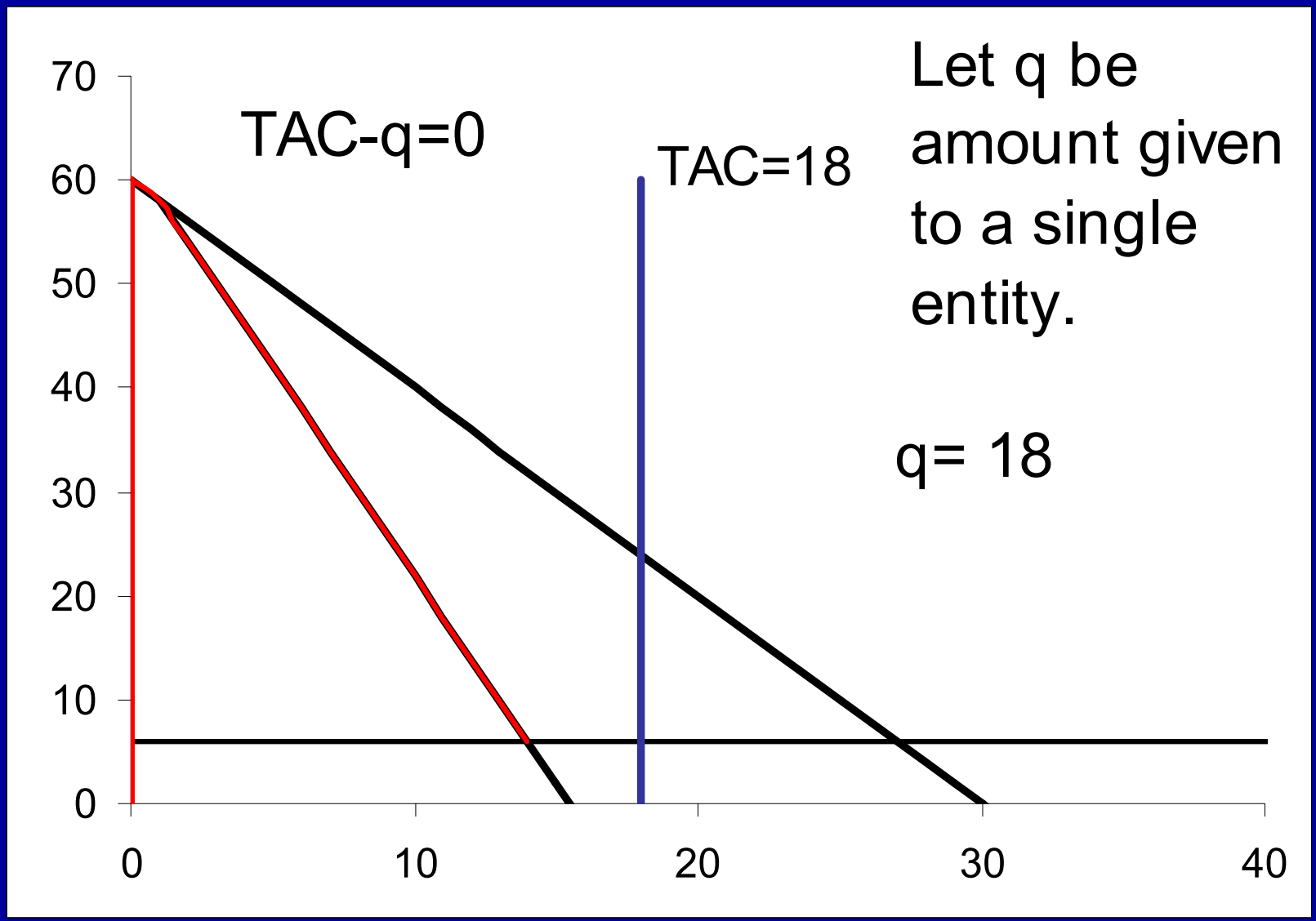

Full TAC will not be produced even with many producers with small share each.
TAC 1
D
MR
MC fish
70
60
50
40
30
20
10
0
0
10
20
30
40

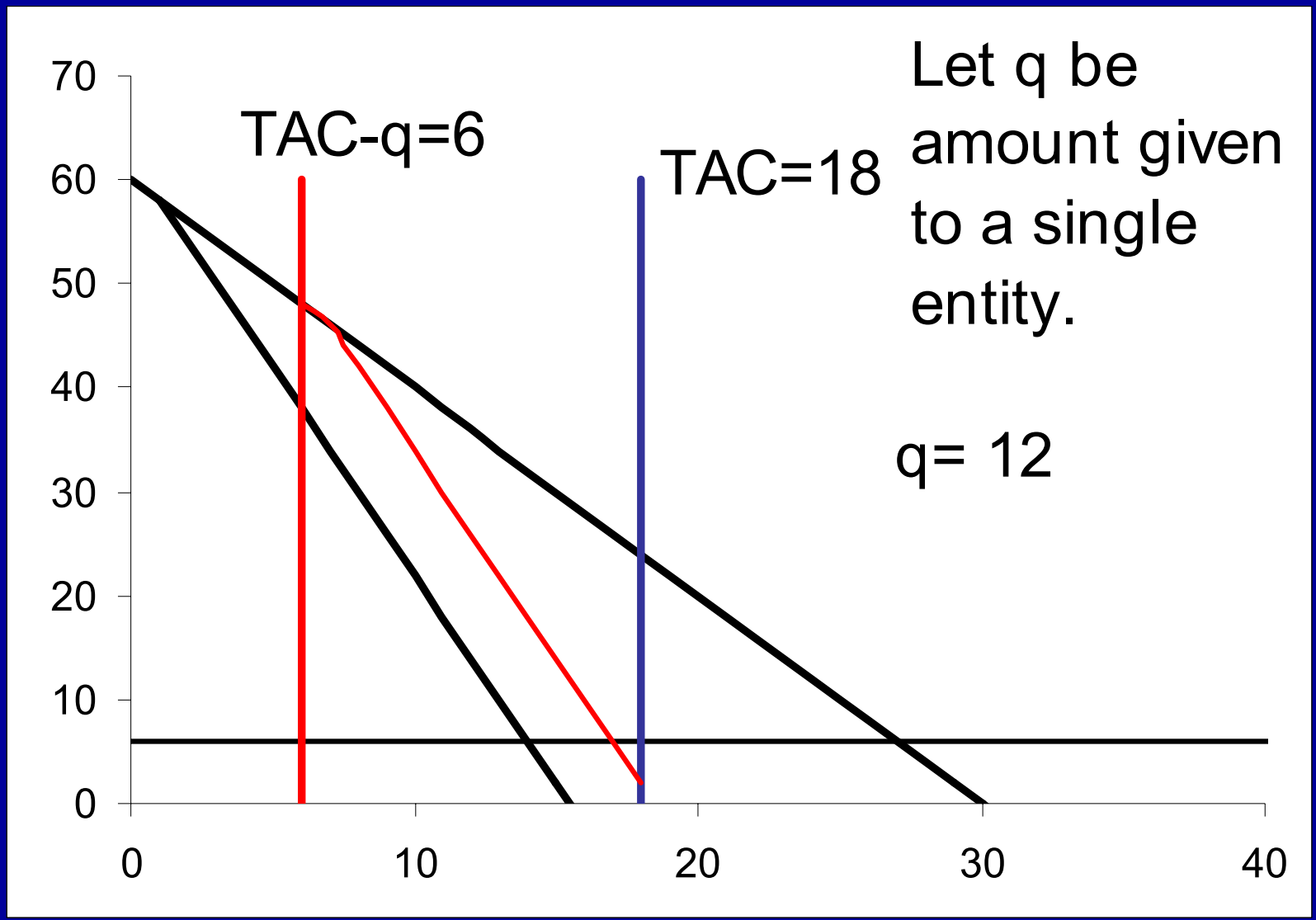

70
60
50
40
30
20
10
0
0
10
20
30
40
D
MR
TAC 2
MC fish
Full TAC will be produced even if all shares are given to a single entity.

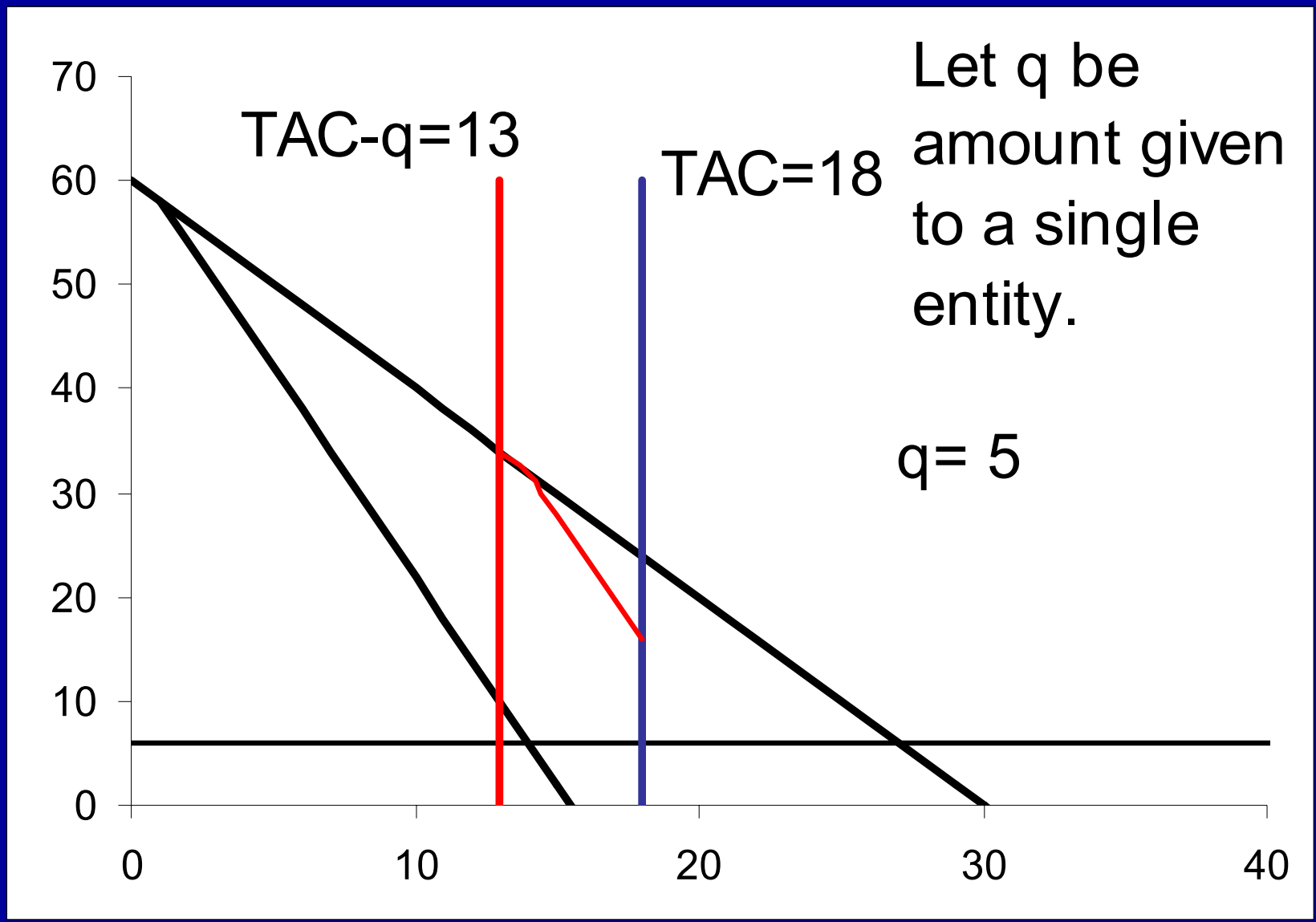

70
60
50
40
30
20
10
0
0
10
20
30
40
D
MR
TAC 3
MC fish
Full TAC will (likely) not be produced if all shares are given to a single entity.

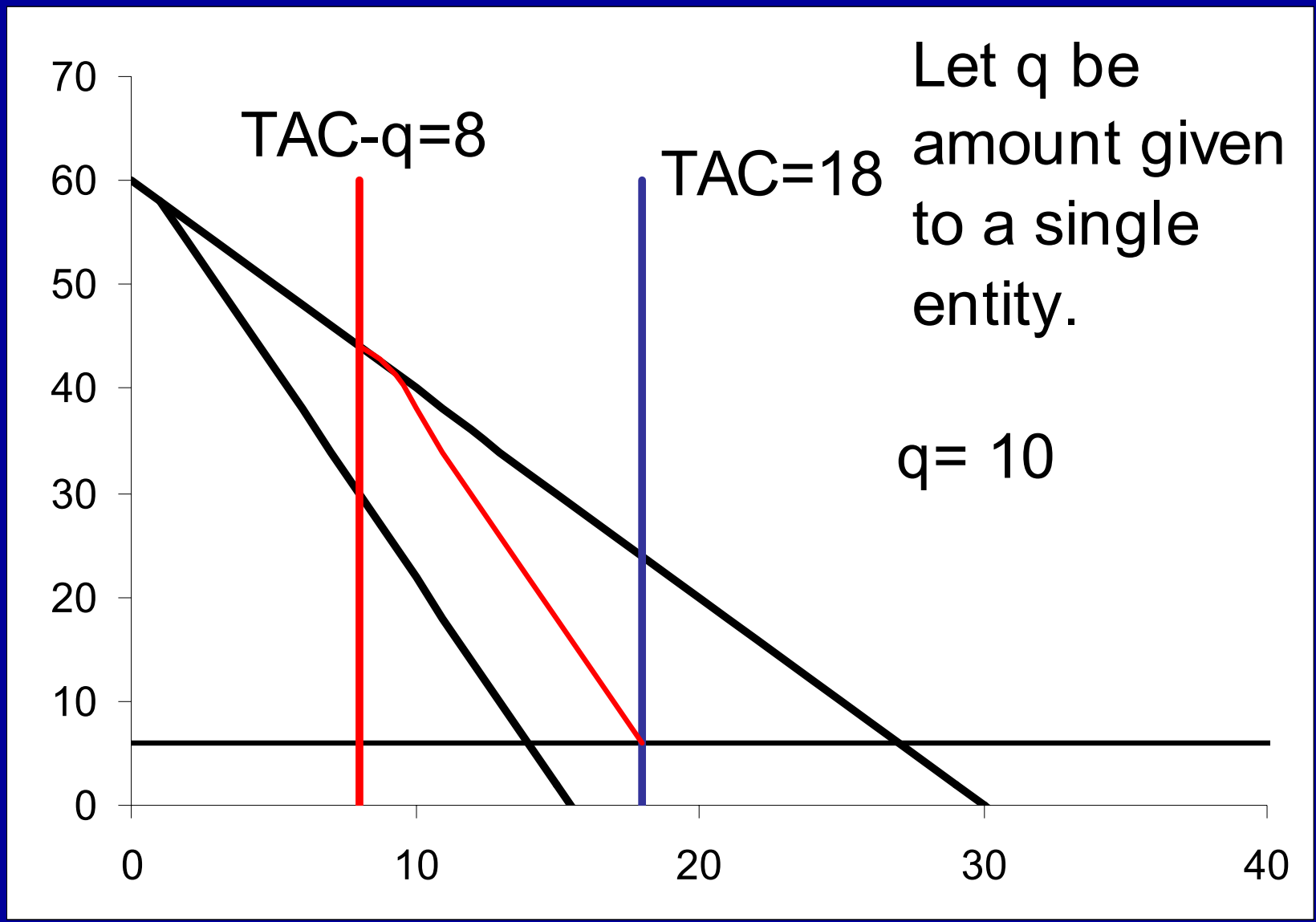
Quiry:

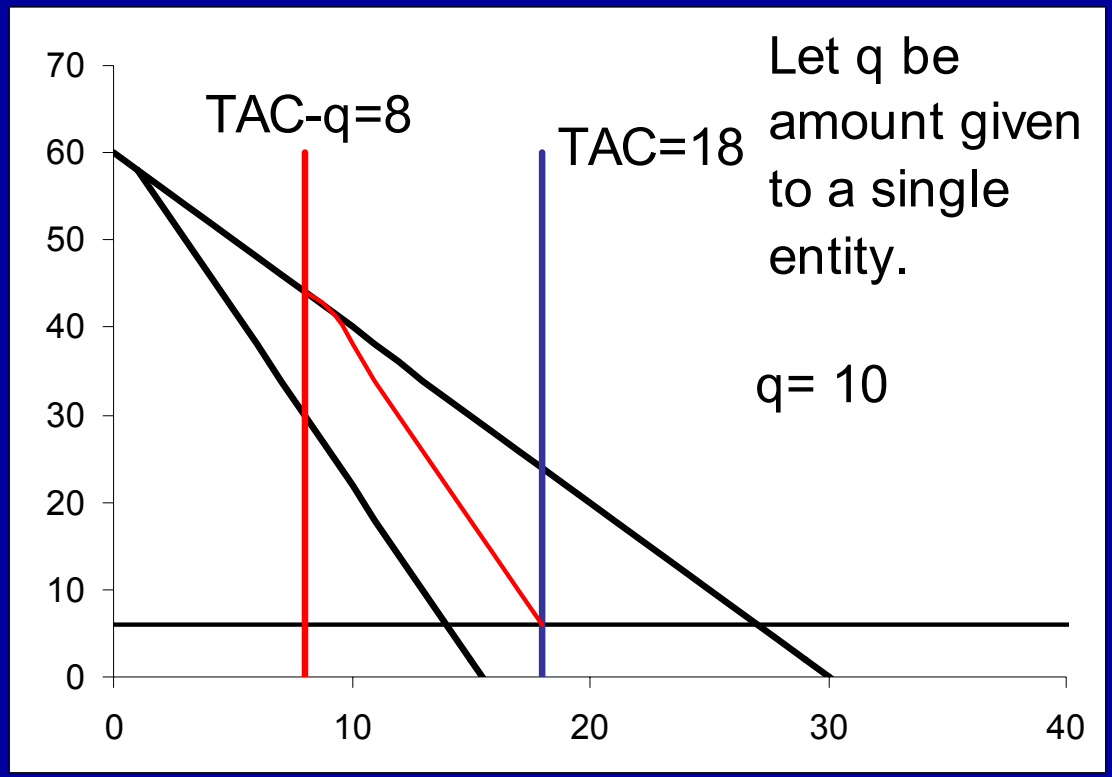
If TAC is between points where P =MC_{fish} and MR = MC_{fish}, what is largest share that can be given to a single entity where there will be not incentives to withhold output?


70
60
50
40
30
20
10
0
0
10
20
30
40
TAC-q=0
TAC=18
Let q be amount given to a single entity.
q= 18


70
60
50
40
30
20
10
0
0
10
20
30
40
TAC-q=6
TAC=18
Let q be amount given to a single entity.
q= 12


70
60
50
40
30
20
10
0
0
10
20
30
40
TAC-q=13
TAC=18
Let q be amount given to a single entity.
q= 5


70
60
50
40
30
20
10
0
0
10
20
30
40
TAC-q=8
TAC=18
Let q be amount given to a single entity.
q= 10



Need to find q where

MR =MC_{fish} at TAC.

Let q be allocation to single entity

Need to find q where there will be no incentive to withhold output

Need to find q where MR = MC_{fish}

$$MR = MC_{fish}$$

$$P + \Delta P/\Delta Q * q = MC_{fish}$$

{P and $\Delta P/\Delta Q$ evaluated at Q =TAC}

$$q = -[P-MC_{fish}]/[\Delta P/\Delta Q]$$

Critical Share = q/TAC

This does not correct for possibility of collusion among independent entities.

Application in the real world

Required Information

- Elasticity of Demand {at TAC}
- Price {at TAC}
- Quantity (TAC)
- CPUE {at TAC}
- MC_{effort} {Do not include FC}

May not be so easy, if current harvest is more that projected TAC.

$$MC_{fish} = CPUE/MC_{efforft}$$

$$e = [P/Q]*[\Delta Q/\Delta P]$$

$$\Delta P/\Delta Q = [1/e]*[P/Q]$$

$$q = -[P-MC_{fish}]/\{[1/e]*[P/Q]\}$$

$$s = q/Q$$

$$s = -[1-Mc_{fish}/P]e$$

$$s = -[1 - Mc_{fish}/P]e$$

If absolute value of e is high enough, s will be greater than 1.

This is case where TAC is such that MR > MC for entire demand curve.

$s = -[1 - MC_{fish}/P]e$

If e = -1

Critical share limit is

[1-Mcfish/P]

As MC_{fish} approaches P, s approaches zero.

As MC_{fish} approaches 0, s approaches 1.

I believe that theory is correct, but is it operational?

Problem.

What if different firms have different MC_{effort} and/or different CPUE?

Use firm with lowest MC_{fish} on the grounds because up to capacity constraint, it will acquire quota shares.

Problem

What if demand conditions or TAC changes over time?

Other Problems????